Wildfire Research and Applications Partnership
Western States Fire Mission 2007

Instructions for installing and using the Collaborative Decision Environment (CDE) Data Visualization Tools

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The Collaborative Decision Environment (CDE) for the Western States Fire Mission comprises three desktop windows. The primary element is a window for displaying geographic data and uses the GoogleEarth application. The second window displays streaming video data from the onboard camera and uses the Quicktime application. The third window is used by collaborating decision makers to send text information back and forth, and uses instant messaging client. This guide will provide information on setting up and using each of these applications. For most, you will need GoogleEarth and a video viewing tool (QuickTime). The "chat" application is reserved for the distributed mission team.

Google Earth and the Collaborative Decision Environment (CDE):

The information presented in this application is intended to provide an accurate near-time picture of current fire situation and supporting flight planning data. The Collaborative Decision Environment (CDE) was developed to present the following types of data:

External Links – launch video player, download this user guide
Wildfire conditions – Inciweb national incidents, MODIS fire detections, and perimeters
Weather conditions – GOESS data, NWS fire weather, forecasts, RAWS stations, global cloud top temps, NWS warning products, Global real-time lightning detection
Western States Fire Mission - Flight Area info, Mission Plans, Real-Time Aircraft positions, fire sensor acquired images, sensor-derived fire perimeters, and previous mission archives, and MODIS overpass times, and location data
National Airspace – FAA ARTCC boundaries, Temporary Flight Restrictions, Special Use Airspace
Miscellaneous Folder – ancillary mission related data.

Under each of these types there are many classes and sources of data. Transparent to the user, data are accessed with scripts that provide for data refresh consistent with the refresh rate of the source (some, like MODIS data are updated after every Aqua / Terra overpass, while the aircraft position data is updated every minute). The specific sources of data may be found by drilling down through the directory structure to a specific data type, right clicking (i.e., clicking the secondary mouse button) on the link, selecting "Properties" ("Get Info" on MACs), and looking in the description box.

Mission status and data dissemination features have been included in the CDE. These are implemented in data layers for aircraft position and sensor data. Each layer includes both the current mission and archival data. The sensor data layer presents icons where scanned image data have been downloaded from the aircraft over fire targets. Clicking

on these icons will permit the user to download the images from the WSFM server and display them in Google Earth. These image data are posted to the server within a few minutes of acquisition. The images are all geo- and terrain-rectified on the aircraft, therefore one can pan, tilt, and "fly-through" the data, draped on the GoogleEarth terrain in real-time.

All the data layers are shown in their respective "folders" and "sub-folders" at the end of this document, in the section entitled "**CDE Data Layer Tree**".

Google Earth and Mission Monitoring (WSFM2007)

A reduced set of layers has been set up for users who are only interested in monitoring the status of the aircraft location and data dissemination for the current mission. It also includes the mission plan, the current large fire incidents and MODIS fire detection.

All the data layers are shown in their respective "folders" and "sub-folders" at the end of this document, in the section entitled "**WSFM2007 Data Layer Tree**".

Installing GoogleEarth

Google Earth is a free application which can be downloaded from ***http://earth.google.com/download-earth.html***. We recommend using the current stable version 4 (update your version for free if you have an earlier version, before proceeding). Be sure to check for the recommended system performance parameters on the download web site to be sure that the machine you are using has adequate CPU, memory and disk drive capacities.

After you download and install GoogleEarth, we recommend you at least review the "User Guide" available under the "Help" menu to familiarize yourself with the basic features of the application. When you have learned how to use the control panel, navigate to different places, and turn on or off the various layers that you are interested in, you are ready to add the CDE network link (as a *.kml* file. A *.kml* (or *.kmz*) file manages access to and refreshes the data layers, such as those identified above. A .kmz file is a compressed, zipped, version of a .kml file. Once a .kml file is added to Google Earth, it is listed in the "Places panel" as a placemark. To add the CDE network link as a placemark, do the following (you do NOT have to do this if you "clicked" on the CDE link at the WRAP web page):

1) In the "Places panel", select "My Places"
2) On the main menu bar (top), click "Add", then select "Network Link..." from the pull-down menu; a form dialog box will be displayed
3) In the "Link" box, type or copy and paste the CDE URL: ***http://sggate.arc.nasa.gov:9518/GoogleEarth/CDE.kml***
4) In the "Name" box, type "CDE"
5) Click the OK button to create the CDE network link

If the user is interested in using the simpler WSFM2007 version, the URL is ***http://sggate.arc.nasa.gov:9518/GoogleEarth/WSFM2007.kml***

In addition to network links to .kml files, local .kml files can also be used. If you receive a *.kml* or *.kmz* file (such as CDE.kml) from the WRAP website or an email, you can open it in Google Earth by double clicking on the link in the email or at the WRAP website. A .kml is a static file, while a network link connects to the current version, which can be refreshed manually or as set in the properties. Because of this, the CDE should be set up as a network link. To move a placemark from "Temporary Places" to "My Places", drag and drop it or right click on the placemark, e.g., CDE, and select "Save to My Places".

Because the various data sources linked in the CDE.kml file can be quite bandwidth intensive, **we recommend that you do NOT turn them on high in the layer tree** but drill down into each data menu to select only the individual data layers that you want to see. This will avoid delays or computer "lockup" when using the CDE. You may want to turn off data layers before exiting Google Earth to avoid data refresh delays when you next launch the application.

Streaming Video

Video imagery from an onboard video camera (viewing the approaching target area) will be available from a web server located at ARC. These data will be used to verify that the fire target is not obscured by clouds, and that the flight track is properly aligned. These data will be served in a format compatible with the Quicktime application.
Quicktime is a free application that can be downloaded from ***http://www.apple.com/quicktime/download/win.html***. (Due to the way Apple bundles the application, iTunes must also be installed at the same time). Be sure to check the recommended system performance parameters on the download web site to be sure that the machine you are using has adequate capability.

After you have installed and verified Quicktime operability, the web server providing the WSFM streaming video can be accessed by opening the Quicktime application, clicking on "File" then selecting "Open URL..." from the pull-down menu. Type the following into the URL window: ***rtsp://sgqtss.arc.nasa.gov:554/wsfm07-1.sdp***. Each subsequent mission will then have a new file name in order of mission order (wsfm07-2.sdp, wsfm07-3.sdp, etc). Please see the calendar at the web page to determine the current mission schedule and number.

The video stream can also be started by clicking on the link in the CDE External Link layer.

Instant Messaging Group Chat

Instant messaging group chat will permit remotely distributed decision makers to communicate with each other when interpreting the data presented in the GoogleEarth data layers. A user name and password will be required for access to this mission team communications link. We will inform the necessary personnel of their chat capabilities prior to the mission initiation.

Additional Planning Tools

The team manager will keep a calendar active of the wildfire mission schedule. This calendar is available at the WRAP project web page (http://geo.arc.nasa.gov/sge/WRAP), and the link to such is shown on the "Home" page of the web site.

CDE Data Layer Tree

The CDE "tree" structure of all the data layers is shown below for ease in allowing you to find the data layers of interest to you. Remember...**do NOT turn on the whole CDE or a large group of layers**. It will slow your system down or crash it, because you would be making an inordinate amount of queries back to the NASA-ARC servers...your desktop / laptop will not be able to handle all the data trying to be served at once. The data tree below represents the "folders" and "sub-folders" that contain all the useful information for the missions. Most of the files and data sets are self-explanatory. Some of the data layers are collected as a "time-series" of information that can be displayed as a looping "movie". An example of such is the Global Lightning Detection data layer. When a "time-series" layer is available, a "time-series" slider bar will appear in the upper right corner of the GoogleEarth data window. You can click on this "start" area and a loop of the time-series of images will be displayed. This is only available if you have downloaded GoogleEarth version 4. The large "bolded-type" shown below are major folder groupings.

CDE

External Links

Launch Video Player

Download CDE Startup Guide

WILDFIRES

Inciweb National Incidents

All named Incidents in nation

CONUS MODIS and Large Fires

Legends and Logos

Current Incident Locations

MODIS MOD14 1km Fire Detections (Last 0-12 hours)

MODIS MOD14 1km Fire Detections (Last 12-24 hours)

MODIS MOD14 1km Fire Detections (6 days previous to last 24 hours)

CONUS Fire Perimeters (From RSAC)

6 previous days

Alaska MODIS and Large Fires

Alaska Fire Perimeters

Hawaii MODIS and Large Fires

Hawaii Fire Perimeters

Canada MODIS and Large Fires

WEATHER

GOES IR

GOES WEST

GOES EAST

NWS Fire Weather Forecast

Day 1 Fire Weather Outlook

- Day 2 Fire Weather Outlook
- **NWS Fire Weather Forecast**
  - Pacific Northwest (Frames, time sequence, use movie bar feature)
  - Pacific Southwest
  - Southern Rockies
  - Northern Rockies
  - Southern Plains
  - Upper Mississippi Valley
  - Southern Mississippi Valley
  - Great Lakes
  - Southeast
  - Northeast
- **RAWS (Remote Automated Weather Stations)**
  - Locations and R/T data from the RAWS stations in western US
- **Global Cloud Top Temperatures**
- **NWS Warning Products**
  - NWS Warnings at most recent time
    - FFW (Flash Flood Warning)
    - SVR (Severe Weather Warning)
- **Global Lightning Detection**

WESTERN STATES FIRE MISSION

- **COA Boundaries**
  - Routes
    - WSFM 2007 Backbones
      - Route A (all turning points in this sub-folder)
      - Route B
      - Route C
    - Excursion Zones
      - Route A 75 NMi border
      - Route A 100 NMi border
      - Route A 150 NMi border
      - Route B 75 NMi border
      - Route B 100 NMi border
      - Route B 150 NMi border
      - Route C 75 NMi border
      - Route C 100 NMi border
      - Route C 150 NMi border
  - Keep-Out Zones
- **Facilities (Locations Relevant to WSFM)**
  - NASA-ARC
  - USFS-RSAC
  - NASA-DFRC
  - NIFC
- **Edwards Weather Station**
  - Link to real-time weather data

Mission Plans
- Current Mission Plan
  - Flight Plan
    - Mission turn and waypoints
- Previous Missions Flown
- Target Template

Aircraft Position
- Current Position (real-time 1-minute flight location updates)
- Previous Missions
  - Flight Date (archive of flight flown from 1-minute interval)

Wildfire Sensor Data
- Sensor Images
  - Current Mission
    - Images / Icon Names
  - Previous Missions
    - Flight Date
      - Image / Icon Names
  - Scanner Band Legend
- Sensor-Derived Fire Perimeters
  - Current Mission
    - Sensorimg_fire perimeters
      - Polygons folders
  - Previous Missions
    - Flight Date
      - Polygons folders
- SGGATE WMS
  - SGGATE WMS Image Overlays

MODIS Overpasses
- Mission Date Periods
  - TERRA / AQUA Pass date and time

NATIONAL AIRSPACE

FAA ARTCC Boundaries
- All National Boundaries for zones

Temporary Flight Restrictions

Special Use Airspace (Near Edwards Air Force Base)

MISCELANEOUS FOLDER

USA Shaded Relief Background

Other *kml* files

WSFM2007

External Links

Launch Video Player
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WILDFIRES

CONUS MODIS and Large Fires
- Legends and Logos
- Current Incident Locations
- MODIS MOD14 1km Fire Detections (Last 0-12 hours)
- MODIS MOD14 1km Fire Detections (Last 12-24 hours)
- MODIS MOD14 1km Fire Detections (6 days previous to last 24 hours)

CONUS Fire Perimeters (From RSAC)
- 6 previous days

Mission Plan

Flight Plan
- Mission turn and waypoints

Aircraft Position

Current Position (real-time 1-minute flight location updates)

Sensor Images

Images / Icon Names

Sensor-Derived Fire Perimeters

Sensorimg_fire perimeters
- Polygons folders